

Is type 2 diabetes a Hereditary Condition? Causes, Genes, and Preventative Measures

Nirmalya Mistry*

Department of Microbiology, Kalinga Institute of Industrial Technology, India

Keywords: Diabetes; Lifestyle

Introduction

Type 2 diabetes has a stronger link to family history than type 1 diabetes, and a person's genes can make them more susceptible to the disease. However, factors such as nutrition and exercise can have an impact on whether genes are expressed and diabetes develops.

According to the National Diabetes Statistics Report 2020, around 34 million Americans have diabetes, with 90–95 percent of them having type 2 diabetes. It is most common in persons over 45 years old, but it is also becoming more prevalent in young adults, teenagers, and toddlers.

Type 2 diabetes is caused by age, inactivity, and obesity, although a person's genes can also play a role [1].

Genetics in Type 2 Diabetes

Type 2 diabetes, according to the American Diabetes Association (ADA), has a greater link to family history and genealogy than type 1. It goes on to add that twin studies have revealed that genetics plays a major role in type 2 diabetes development.

Race can also have a factor, according to the ADA, with Asian, Black, and Latino people having a higher prevalence. However, genetics may not be the sole cause.

Diet and lifestyle choices, as well as the environment, play a role in the development of type 2 diabetes. Exercise and achieving or maintaining a moderate weight, according to the American Diabetes Association, can help avoid type 2 diabetes.

Obesity can have a genetic component, and families tend to have similar eating habits. This can increase the risk of type 2 diabetes in people who have a genetic predisposition.

Which genes are linked to the development of type 2 diabetes?

According to a 2013 study, the following genes can raise the risk of type 2 diabetes:

CAPN10: is a protein degrading enzyme gene. It was the first gene linked to type 2 diabetes that scientists could definitively prove.

TCF7L2: Across all racial groups, this protein-coding gene is linked to type 2 diabetes the most.

ABCC8: is a gene that affects insulin release.

(GCGR): Glucagon receptor gene

GCK: This is the gene for glucokinase, a glucose-metabolizing enzyme that also serves as a glucose sensor [2].

The interaction between genes and their surroundings

The environment interacts with a person's genes to turn their genes on or off. Epigenetics is a process that can play a role in the development of type 2 diabetes.

Changes in epigenetics do not affect DNA sequence, but rather gene expression. Epigenetic alterations can also be caused by environmental variables such as nutrition, exercise, and infection.

What are the chances of inheriting type 2 diabetes?

One parent: Having one parent with type 2 diabetes increases one's lifetime risk by 40%.

Both parents: Having both parents with type 2 diabetes increases one's lifetime risk by 70%.

First-degree relative: If a first-degree relative has type 2 diabetes, a person is three times more likely to develop the disease. A first-degree relative, such as a parent or full sibling, is someone with whom a person shares 50% of their genes [3].

Type 2 diabetes prevention

Whether a person with a genetic susceptibility to type 2 diabetes gets the condition is influenced by dietary and behavioural factors.

Dietary considerations: Maintaining a healthy weight is crucial in lowering the risk of acquiring type 2 diabetes. However, between 2013 and 2016, 89 percent of American adults who had recently been diagnosed with diabetes were overweight or obese.

Obese adults can delay or assist prevent diabetes by decreasing 5–7% of their initial weight, according to research from the Diabetes Prevention Program. Individuals should try eating smaller quantities, selecting lower-fat foods, and avoiding sugary beverages.

Lifestyle factors: To try to lessen one's chance of getting type 2 diabetes, one can reduce or avoid the following: Intake of alcohol, smoking, inactivity, stress, and antibiotics [4].

References

1. Zimmet P, Alberti KG, Shaw J (2001) Global and societal implications of the diabetes epidemic. *Nature* 414: 782-787.
2. Chan JC, Malik V, Jia W, Kadowaki T, Yajnik CS, et al. (2009) Diabetes in Asia: epidemiology, risk factors, and pathophysiology. *JAMA* 301: 2129-2140.
3. McNeely MJ, Boyko EJ (2004) Type 2 diabetes prevalence in Asian Americans: results of a national health survey. *Diabetes Care* 27: 66-69.
4. Rokholm B, Baker JL, Sorensen TI (2010) The levelling off of the obesity epidemic since the year 1999—a review of evidence and perspectives. *Obes Rev* 11: 835-846.

*Corresponding author: Nirmalya Mistry, Department of Microbiology, Kalinga Institute of Industrial Technology, India; E-mail: nirmalya.m@gmail.com

Received July 28, 2021; Accepted August 19, 2021; Published August 26, 2021

Citation: Mistry N (2021) Is type 2 diabetes a Hereditary Condition? Causes, Genes, and Preventative Measures. *J Palliat Care Med* 11: 426.

Copyright: © 2021 Mistry N. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.